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EDWARDS & ANGELL, LLP			LU, KUEN S	
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BOSTON, MA 02205			2167	

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/965,393	MCCANN ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Kuen S Lu	2167

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 09 August 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-42 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-42 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date: _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date: _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

**DETAILED ACTION**

**Specification**

**Response to Amendments**

1. The Applicants' Amendments filed on 7/21/2004 is noted and considered. The Amendment to claims is being addressed in the following "**Claim Rejections**" and "**Response to Arguments**" Sections.

**Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-42 are rejected under 35 U.S.C. 102(e) as anticipated by Srinivasan et al. (U.S. Patent 6,823,336, hereafter "Srinivasan").

As per Claim 1, Srinivasan teaches the following:

"storing a file systems write data operation in a first temporary data store" (See Fig. 2, col. 3, lines 4-5 and col. 17, lines 12-15 wherein Srinivasan's processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions is

equivalent to Applicant's storing a file systems write data operation in a first temporary data store);

"mirroring the file systems write data operation in a second temporary data store" (See Figs. 2, 8, col. 3, lines 54-57 and col. 10, lines 6-29 wherein Srinivasan's a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage system is equivalent to Applicant's mirroring the file systems write data operation in a second temporary data store); and

"deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store to the storage medium" (See col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 wherein Srinivasan's mirroring over, directory deletion and toggling read and write switches only after transaction committed suggests the teaching of deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store to the storage medium).

As per claim 2, Srinivasan teaches "writing the mirrored file systems write data operation from the second temporary data store to the storage medium in the case when the file systems write data operation is not successfully written from the first temporary data store" (See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan's the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary

storage and unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant's writing the mirrored file systems write data operation from the second temporary data store to the storage medium in the case when the file systems write data operation is not successfully written from the first temporary data store).

As per Claim 11, Srinivasan teaches the following:

"storing a file systems write data operation in a first temporary data store" (See Fig. 2, col. 3, lines 4-5 and col. 17, lines 12-15 wherein Srinivasan's processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions is equivalent to Applicant's storing a file systems write data operation in a first temporary data store);

"mirroring the file systems write data operation in a second temporary data store" (See Figs. 2, 8, col. 3, lines 54-57 and col. 10, lines 6-29 wherein Srinivasan's a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage system is equivalent to Applicant's mirroring the file systems write data operation in a second temporary data store);

"determining if the file systems write data operation stored in the first temporary data store is successfully written to the storage medium" (Fig. 2, col. 5, line 56 – col. 6, line

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50 wherein Srinivasan's the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant's determining if the file systems write data operation stored in the first temporary data store is successfully written to the storage medium);

"deleting the file systems write data operation from the second temporary data store when it is determined that the file systems write data operation was successfully written from the first temporary data store to the storage medium" (See Fig. 2, col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 wherein Srinivasan's mirroring over, directory deletion and toggling read and write switches only after transaction committed suggests the teaching of deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store to the storage medium); and "writing the mirrored file systems write data operation from the second temporary data store to the storage medium in the case when the file systems write data operation is not successfully written from the first temporary data store" (See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan's the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the

write-selected storage of dataset revisions is equivalent to Applicant's writing the mirrored file systems write data operation from the second temporary data store to the storage medium in the case when the file systems write data operation is not successfully written from the first temporary data store).

As per Claim 16, Srinivasan teaches the following:

"storing a file systems write data operation in a first temporary data store of one of the plurality of servers" (See Fig. 2, col. 3, lines 4-5 and col. 17, lines 12-15 wherein Srinivasan's processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions in one of the two host systems is equivalent to Applicant's storing a file systems write data operation in a first temporary data store of the one of the plurality of servers);

"mirroring the file systems write data operation in a second temporary data store of another one of the plurality of servers" (See Figs. 2, 8, col. 3, lines 54-57 and col. 10, lines 6-29 wherein Srinivasan's a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage systems between the primary and the secondary hosts is equivalent to Applicant's mirroring the file systems write data operation in a second temporary data store of another one of the plurality of servers);

"deleting the file systems write data operation from the second temporary data store of said another one of the plurality of servers when it is determined the file systems write

data operation in the first temporary data store of said one of the plurality of servers was successfully written to the storage medium" (See col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 wherein Srinivasan's mirroring over, directory deletion and toggling read and write switches only after transaction committed suggests the teaching of deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store to the storage medium); and

"writing the mirrored file systems write data operation in the second temporary data store of said another of the plurality of servers to the storage medium when it is determined that the file systems write data operation was not successfully written to the storage medium from the first temporary data store of said one of the plurality of servers" (See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan's the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant's writing the mirrored file systems write data operation in the second temporary data store of said another of the plurality of servers to the storage medium when it is determined that the file systems write data operation was not successfully written to the storage medium from the first temporary data store of said one of the plurality of servers).

As per Claim 24, Srinivasan teaches the following:

“storing a file systems write data operation in a first temporary data store of one of the plurality of servers” (See Fig. 2, col. 3, lines 4-5 and col. 17, lines 12-15 wherein Srinivasan’s processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions in one of the two host systems is equivalent to Applicant’s storing a file systems write data operation in a first temporary data store); and

“mirroring the file systems write data operation in a second temporary data store of another one of the plurality of servers” (See Figs. 2, 8, col. 3, lines 54-57 and col. 10, lines 6-29 wherein Srinivasan’s a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage systems between the primary and the secondary hosts is equivalent to Applicant’s mirroring the file systems write data operation in a second temporary data store of another one of the plurality of servers).

As per Claim 25, Srinivasan teaches the following:

“deleting the file systems write data operation from the second temporary data store of said another one of the plurality of servers when it is determined the file systems write data operation in the first temporary data store of said one of the plurality of servers was successfully written to the storage medium” (See col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 wherein Srinivasan’s mirroring over, directory deletion and

toggling read and write switches only after transaction committed suggests the teaching of deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store to the storage medium); and “writing the mirrored file systems write data operation in the second temporary data store of said another of the plurality of servers to the storage medium when it is determined that the file systems write data operation was not successfully written to the storage medium from the first temporary data store of said one of the plurality of servers” (See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan’s the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and unless** all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant’s writing the mirrored file systems write data operation in the second temporary data store of said another of the plurality of servers to the storage medium when it is determined that the file systems write data operation was not successfully written to the storage medium from the first temporary data store of said one of the plurality of servers).

As per Claim 31, Srinivasan teaches the following:

“storing a file systems write data operation in a first temporary data store of one of the servers of the cluster” (See Fig. 2, col. 3, lines 4-5, col. 17, lines 12-15 and 29-53

wherein Srinivasan's processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions in one of the two host systems and furthermore, cluster architecture is suggested by each storage system is directly linked to multiple processors is equivalent to Applicant's storing a file systems write data operation in a first temporary data store);

"mirroring the file systems write data operation being stored in the first temporary store of said one of the servers of the cluster in the second temporary data store of another of the servers of the cluster" (See Figs. 2, 8, col. 3, lines 54-57, col. 10, lines 6-29 and col. 17, lines 12-15 and 29-53 wherein Srinivasan's a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage systems between the primary and the secondary hosts and furthermore, cluster architecture is suggested by each storage system is directly linked to multiple processors is equivalent to Applicant's mirroring the file systems write data operation in a second temporary data store of another one of the plurality of servers);

"deleting the mirrored file systems write data operation from the second temporary data store of said another one of the servers of the cluster in the case when the file systems write data operation is successfully written from the first temporary data store of said one of the of the cluster to the storage medium" (See col. 2, lines 18-21, col. 16, lines 21-28, col. 6, lines 23-50 and col. 17, lines 12-15 and 29-53 wherein Srinivasan's mirroring over, directory deletion and toggling read and write switches only after

transaction committed suggests the teaching of deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store to the storage medium, and furthermore, cluster architecture is suggested by each storage system is directly linked to multiple processors); and

“writing the mirrored file systems write data operation from the second temporary data store of said another of the servers of the cluster to the storage medium when the file systems write data operation is not successfully written to the storage medium from the first temporary data store of said one of the servers of the cluster” (See Fig. 2, col. 5, line 56 – col. 6, line 50 and col. 17, lines 12-15 and 29-53 wherein Srinivasan’s the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions and furthermore, cluster architecture is suggested by each storage system is directly linked to multiple processors is equivalent to Applicant’s writing the mirrored file systems write data operation in the second temporary data store of said another of the plurality of servers to the storage medium when it is determined that the file systems write data operation was not successfully written to the storage medium from the first temporary data store of said one of the plurality of servers).

As per Claim 34, Srinivasan teaches the following:

“storing a file systems write data operation in a first temporary data store of one server” (See Fig. 2, col. 3, lines 4-5 and col. 17, lines 12-15 wherein Srinivasan’s processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions in one of the two host systems is equivalent to Applicant’s storing a file systems write data operation in a first temporary data store);

“mirroring the file systems write data operation being stored in the first temporary store of said one server in the second temporary data store of another server” (See Figs. 2, 8, col. 3, lines 54-57 and col. 10, lines 6-29 wherein Srinivasan’s a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage systems between the primary and the secondary hosts is equivalent to Applicant’s mirroring the file systems write data operation in a second temporary data store of another one of the plurality of servers);

“monitoring the operational status of the each server” (See the Abstract where set of revisions are alternately written to either a first buffer and a second buffer and, furthermore, at col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 where toggling read and write switches only after transaction committed teaches detecting the status of the servers is equivalent to Applicant’s monitoring the operational status of the each server); and

“writing the mirrored file systems write data operation from the second temporary data store of said another server to the storage medium when said monitoring determines

that the said server is not operational" (See col. 8, lines 34-58 where the read-selected directory of dataset revisions is not empty, the subsequent write commands from the link is not placed in the dataset revisions until completion of the integration of the dataset revisions into the secondary storage is equivalent to Applicant's writing the mirrored file systems write data operation from the second temporary data store of said another server to the storage medium when said monitoring determines that the said server is not operational).

As per Claim 38, Srinivasan teaches the following:

"storing a given file systems write data operation in the first temporary data store of one of the plurality of servers, the server having ownership over that portion of the storage medium the given file systems write operation is to be written to" (See Fig. 2, col. 3, lines 4-5 and col. 17, lines 12-15 wherein Srinivasan's processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions in one of the two host systems, and furthermore, the two storages of dataset revisions are toggled between the two servers is interpreted as being owned by the servers is equivalent to Applicant's storing a given file systems write data operation in the first temporary data store of one of the plurality of servers, the server having ownership over that portion of the storage medium the given file systems write operation is to be written to);

"copying the given file systems write data operation being stored in the first temporary store in the second temporary data store of the other of the plurality of servers, the server that does not have ownership over that portion of the storage medium the given file systems write operation is to be written to" (See Figs. 2, 8, col. 3, lines 54-57, col. 10, lines 6-29 and col. 10, line 58 – col. 11, line 11 wherein Srinivasan's a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is copied to buffer the updates of the file storage systems between the primary and the secondary hosts where host does not have ownership of the other host's delata volume storage is equivalent to Applicant's copying the given file systems write data operation being stored in the first temporary store in the second temporary data store of the other of the plurality of servers, the server that does not have ownership over that portion of the storage medium the given file systems write operation is to be written to);

"deleting the copy of the given file systems write data operation from the second temporary data store when it is determined that the given file systems write data operation stored in the first temporary data store is successfully written to the storage medium" (See col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 wherein Srinivasan's mirroring over, directory deletion and toggling read and write switches only after transaction committed suggests the teaching of deleting the copy of the given file systems write data operation from the second temporary data store when it is determined that the given file systems write data operation stored in the first temporary data store is successfully written to the storage medium).

“writing the copy of the given file systems write data operation in the second temporary data store to the storage medium when it is determined that the given file systems write data operation was not successfully written to the storage medium from the first temporary data store” (See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan’s the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant’s writing the copy of the given file systems write data operation in the second temporary data store to the storage medium when it is determined that the given file systems write data operation was not successfully written to the storage medium from the first temporary data store).

As per Claim 3, Srinivasan further teaches “determining if the file systems write data operation is successfully written from the first temporary data store” (See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan’s the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant’s determining if the file systems write data operation is successfully written from the first temporary data store).

As per Claims 4 and 12, Srinivasan teaches “mirroring is performed one of concurrent with, during, or following said storing of the file systems write data operation in the first temporary data store” (See Figs. 8-9 and col. 10, line 58 – col. 11, line 11 wherein Srinivasan’s a delta volume is written to the primary host, mirroring to a delat volume of the secondary host is equivalent to Applicant’s mirroring is performed one of concurrent with, during, or following said storing of the file systems write data operation in the first temporary data store).

As per Claims 5 and 13, Srinivasan teaches “sending a signal back to a source of the file system write data operation when it is determined that the file systems write data operation is successfully stored in the first and second temporary data stores” (See col. 8, lines 34-58 and col. 14, line 63 – col. 15, line15 wherein Srinivasan’s storage controller signaling if integration of dataset into the dataset secondary storage, and furthermore, message receiving and sending volumes are created on primary and secondary data storage systems storing sequence numbers to signal the synchronization of the two storage systems is equivalent to Applicant’s sending a signal back to a source of the file system write data operation when it is determined that the file systems write data operation is successfully stored in the first and second temporary data stores).

As per Claim 6, Srinivasan teaches the following:

"storing a file systems write data operation in a first temporary data store of the one of the plurality of servers" (See Fig. 2, col. 3, lines 4-5 and col. 17, lines 12-15 wherein Srinivasan's processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions in one of the two host systems is equivalent to Applicant's storing a file systems write data operation in a first temporary data store of the one of the plurality of servers);

"mirroring the file systems write data operation in a second temporary data store of said one of the plurality of servers" (See Figs. 2, 8, col. 3, lines 54-57 and col. 10, lines 6-29 wherein Srinivasan's a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage systems between the primary and the secondary hosts is equivalent to Applicant's mirroring the file systems write data operation in a second temporary data store of another one of the plurality of servers); and

"deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store of said one of the plurality of servers to the storage medium" (See deleting the file systems write data operation from the second temporary data store of said another one of the plurality of servers when it is determined the file systems write data operation in the first temporary data store of said one of the plurality of servers was successfully written to the storage medium).

As per Claim 7, Srinivasan teaches “writing includes writing the mirrored file systems write data operation from the second temporary data store of said another of the plurality of the servers to the storage medium in the case when the file systems write data operation is not successfully written from the first temporary data store of said one of the plurality of servers” (See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan’s the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant’s writing includes writing the mirrored file systems write data operation from the second temporary data store of said another of the plurality of the servers to the storage medium in the case when the file systems write data operation is not successfully written from the first temporary data store of said one of the plurality of servers).

As per Claim 14, Srinivasan teaches the following:

“said storing includes storing a file systems write data operation in the first temporary data store of the one of the plurality of servers” (See Fig. 2, col. 3, lines 4-5 and col. 17, lines 12-15 wherein Srinivasan’s processing the first set of revisions to form a directory of the first set of revisions and revisions in each set are written to a buffer and processed to produce a directory of the set of revisions in one of the two host systems

is equivalent to Applicant's storing the file systems write data operation in a first temporary data store of the one of the plurality of servers);  
“said mirroring includes mirroring the file systems write data operation being stored in the first temporary data store of said one of the plurality of servers in the secondary temporary data store of another of the plurality of servers” (See Figs. 2, 8, col. 3, lines 54-57 and col. 10, lines 6-29 wherein Srinivasan’s a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage systems between the primary and the secondary hosts is equivalent to Applicant’s said mirroring includes mirroring the file systems write data operation being stored in the first temporary data store of said one of the plurality of servers in the secondary temporary data store of another of the plurality of servers); and  
“said deleting includes deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store of said one of the plurality of servers to the storage medium” (See col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 wherein Srinivasan’s mirroring over, directory deletion and toggling read and write switches only after transaction committed suggests the teaching of deleting includes deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store of said one of the plurality of servers to the storage medium); and

"said writing includes writing the mirrored file systems write data operation from the second temporary data store of said another of the plurality of the servers to the storage medium in the case when the file systems write data operation is not successfully written from the first temporary data store of said one of the plurality of servers" (See See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan's the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant's writing the mirrored file systems write data operation from the second temporary data store of said another of the plurality of the servers to the storage medium in the case when the file systems write data operation is not successfully written from the first temporary data store of said one of the plurality of servers).

As per Claim 8, Srinivasan teaches "determining if the file systems write data operation is successfully written from the first temporary data store of said one of the plurality of servers" (See See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan's the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant's determining if the file systems write data operation

is successfully written from the first temporary data store of said one of the plurality of servers).

As per Claims 9, 18 and 26, Srinivasan teaches “mirroring is performed one of concurrent with, during, or following said storing of the file systems write data operation in the first temporary data store of said one of the plurality of servers” (See Figs. 8-9 and col. 10, line 58 – col. 11, line 11 wherein Srinivasan’s a delta volume is written to the primary host, mirroring to a delat volume of the secondary host is equivalent to Applicant’s mirroring is performed one of concurrent with, during, or following said storing of the file systems write data operation in the first temporary data store of said one of the plurality of servers).

As per Claims 10, 15, 20 and 28 Srinivasan teaches “operating system I/O of said one of the plurality of servers is not operational” (See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan’s the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant’s operating system I/O of said one of the plurality of servers is not operational).

As per Claim 17, Srinivasan teaches “determining if the file systems write data operation is successfully written to the storage medium from the first temporary data store of said one of the plurality of servers” (See See See Fig. 2, col. 5, line 56 – col. 6, line 50 wherein Srinivasan’s the toggle connecting the two hosts will not be switched until all revisions in one of the two storages of dataset revisions have been transferred to the dataset secondary storage **and** unless all of the updates since the last transaction commit command have actually been written from the link into one of the write-selected storage of dataset revisions is equivalent to Applicant’s determining if the file systems write data operation is successfully written to the storage medium from the first temporary data store of said one of the plurality of servers).

As per Claims 19 and 27, Srinivasan teaches “sending a signal back to a source of the file system write data operation when it is determined that the file systems write data operation is successfully stored in the first temporary data store of said one of the plurality of servers and the mirrored file systems write data operation is stored in the second temporary data store of said another of said plurality of servers” (See col. 8, lines 34-58 and col. 14, line 63 – col. 15, line 15 wherein Srinivasan’s storage controller signaling if integration of dataset into the dataset secondary storage, and furthermore, message receiving and sending volumes are created on primary and secondary data storage systems storing sequence numbers to signal the synchronization of the two storage systems is equivalent to Applicant’s sending a signal back to a source of the file system write data operation when it is determined that the file systems write data

operation is successfully stored in the first temporary data store of said one of the plurality of servers and the mirrored file systems write data operation is stored in the second temporary data store of said another of said plurality of servers).

As per Claims 21, Srinivasan teaches the following:

“a storage medium” (See Fig. 8, elements 122-123, 132-133, 118 and 128 wherein Srinivasan’s disk adaptors and data storage systems is equivalent to Applicant’s a storage medium);

“a plurality of servers servicing the storage medium, each server including a first temporary data store and a second temporary data store” (See Fig. 8 and col. 9, line 51 – col. 10, line 57 wherein Srinivasan’s the cache and delta volume storage are the temporary stores of each of the two servers); and

“a communications link, the communications link being configured and arranged so as to communicatively interconnect the first temporary data store of one of the plurality of servers to the second temporary data store of another of the plurality of servers and to communicatively interconnect the first temporary data store of said another of the plurality of servers to the second temporary data store of said one of the plurality of servers” (See Fig. 8 and col. 10, lines 6-29 wherein Srinivasan’s two redundant communication links communicate the storage systems of the servers via remote mirroring facilities of the servers is equivalent to Applicant’s a communications link, the communications link being configured and arranged so as to communicatively interconnect the first temporary data store of one of the plurality of servers to the

second temporary data store of another of the plurality of servers and to communicatively interconnect the first temporary data store of said another of the plurality of servers to the second temporary data store of said one of the plurality of servers).

As per Claim 22, Srinivasan teaches “communications link comprises a first and second communications interconnection, the first communications interconnection being configured and arranged so as to communicatively interconnect the first temporary data store of one of the plurality of servers to the second temporary data store of another of the plurality of servers and the second communications interconnection being configured and arranged to communicatively interconnect the first temporary data store of said another of the plurality of servers to the second temporary data store of said one of the plurality of servers” (See Fig. 8 and col. 10, lines 6-29 wherein Srinivasan’s two redundant communication links communicate the storage and temporary storage systems of the servers via remote mirroring facilities of the servers is equivalent to Applicant’s communications link comprises a first and second communications interconnection, the first communications interconnection being configured and arranged so as to communicatively interconnect the first temporary data store of one of the plurality of servers to the second temporary data store of another of the plurality of servers and the second communications interconnection being configured and arranged to communicatively interconnect the first temporary data store of said another of the

plurality of servers to the second temporary data store of said one of the plurality of servers).

As per Claim 23, Srinivasan teaches “first and second communications interconnects are each one of a fiber optical channel, a gigabit Ethernet and an infiniband” (See col. 17, lines 47-53 wherein Srinivasan’s communication link utilizes Ethernet, fiber channel, SCSI, etc. technologies is equivalent to Applicant’s first and second communications interconnects are each one of a fiber optical channel, a gigabit Ethernet and an infiniband).

As per Claim 29, Srinivasan teaches “file systems write data operations are sourced from one or more client computers of a computer network” (See col. 5, lines 60-66 and col. 17, lines 43-53 wherein Srinivasan’s data storages are loaded from the same external source and client computers are linked on data network suggests file systems write data operations are sourced from one or more client computers of a computer network);

“each of the plurality of servers includes a device that operably interconnects each of the plurality of servers to the computer network” (See Fig. 8, elements 125-126 and col. 17, lines 43-53 wherein Srinivasan’s communication link for mirroring communicates servers and NFS implementation further suggests each of the plurality of servers includes a device that operably interconnects each of the plurality of servers to the computer network); and

"said program for execution on the central processing unit further includes instructions and criteria for receiving and processing each file systems write data operation being sourced from any one of the one or more client computers" (See col. 5, lines 60-66 and col. 17, lines 43-53 and col. 3, lines 58-65 wherein Srinivasan's data storages are initially empty and loaded from the same external source and program storage device containing program executable by storage controller for performing read and write commands is equivalent to Applicant's said program for execution on the central processing unit further includes instructions and criteria for receiving and processing each file systems write data operation being sourced from any one of the one or more client computers).

As per Claim 30, Srinivasan further teaches "sending a signal back to said one of the one or more client computers sourcing a given file system write data operation when it is determined that the given file systems write data operation is successfully stored in the first temporary data store of said one of the plurality of servers and the copy of the given file systems write data operation is stored in the second temporary data store of said another of said plurality of servers" (See col. 8, lines 34-58 and col. 14, line 63 – col. 15, line 15 wherein Srinivasan's storage controller signaling if integration of dataset into the dataset secondary storage, and furthermore, message receiving and sending volumes are created on primary and secondary data storage systems storing sequence numbers to signal the synchronization of the two storage systems is equivalent to Applicant's sending a signal back to said one of the one or more client computers

sourcing a given file system write data operation when it is determined that the given file systems write data operation is successfully stored in the first temporary data store of said one of the plurality of servers and the copy of the given file systems write data operation is stored in the second temporary data store of said another of said plurality of servers).

As per Claim 32, Srinivasan further teaches the following:

“monitoring an operational status of each of the servers of the cluster” (See the Abstract where set of revisions are alternately written to either a first buffer and a second buffer and, furthermore, at col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 where toggling read and write switches only after transaction committed teaches detecting the status of the servers is equivalent to Applicant’s monitoring an operational status of each of the servers of the cluster); and

“causing writing of mirrored file systems write data operation from the second temporary data store of said another of the servers of the cluster to the storage medium, when it is determined from said monitoring that said one of the clusters of the server is not operational” (See col. 8, lines 34-58 where the read-selected directory of dataset revisions is not empty, the subsequent write commands from the link is not placed in the dataset revisions until completion of the integration of the dataset revisions into the secondary storage is equivalent to Applicant’s causing writing of mirrored file systems write data operation from the second temporary data store of said another of the servers

of the cluster to the storage medium, when it is determined from said monitoring that said one of the clusters of the server is not operational).

As per Claim 33, Srinivasan teaches “a plurality of mirrored file systems write data operations are stored in the second temporary data store of said another of the servers of the cluster and wherein said writing includes writing all of the plurality of mirrored file systems write data operations” (See Figs. 2, 8, col. 3, lines 54-57 and col. 10, lines 6-29 wherein Srinivasan’s a mirroring facility is interfacing to a cache for linking the primary and the secondary data storage system and a delta volume is mirrored to buffer the updates of the file storage systems between the primary and the secondary hosts is equivalent to Applicant’s a plurality of mirrored file systems write data operations are stored in the second temporary data store of said another of the servers of the cluster and wherein said writing includes writing all of the plurality of mirrored file systems write data operations).

As per Claims 35 and 40, Srinivasan teaches “a plurality of mirrored file systems write data operations are stored in the second temporary data store and wherein said writing includes writing all of the plurality of mirrored file systems write data operations from the second temporary data store” (See Fig. 8 and col. 10, line 51 – col. 10, line 29 wherein Srinivasan’s the delta volume is utilized as the secondary and mirroring storages for each storage system where the delta volume holding the updates to the file system storage is equivalent to Applicant’s a plurality of mirrored file systems write data

operations are stored in the second temporary data store and wherein said writing includes writing all of the plurality of mirrored file systems write data operations from the second temporary data store).

As per Claims 36 and 41, Srinivasan teaches “writing of all of the plurality of mirrored file system write data operations are completed before accepting any new file system write data operations for writing to the storage medium” (See col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 wherein Srinivasan’s mirroring over, directory deletion and toggling read and write switches only after transaction committed suggests teaching of writing of all of the plurality of mirrored file system write data operations are completed before accepting any new file system write data operations for writing to the storage medium).

As per Claims 37 and 42, Srinivasan teaches “stopping said mirroring of file systems write data operations in the case when said one server is not operational” and “restarting said mirroring of file systems write data operations in the case when said one server is returned to operation” (See col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 wherein Srinivasan’s mirroring over, directory deletion and toggling read and write switches only after transaction committed suggests teaching of stopping said mirroring of file systems write data operations in the case when said one server is not operational, and restarting said mirroring of file systems write data operations in the case when said one server is returned to operation).

As per Claim 39, Srinivasan teaches the following:

“monitoring the operational status of each of the plurality of servers” (See the Abstract where set of revisions are alternately written to either a first buffer and a second buffer and, furthermore, at col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 where toggling read and write switches only after transaction committed teaches detecting the status of the servers is equivalent to Applicant’s monitoring the operational status of each of the plurality of servers);

“determining which server is inoperable and a particular portion of the storage medium the inoperable server has ownership over” (See col. 8, lines 34-58 and col. 14, line 63 – col. 15, line15 wherein Srinivasan’s storage controller signaling if integration of dataset into the dataset secondary storage, and furthermore, message receiving and sending volumes are created on primary and secondary data storage systems storing sequence numbers to signal the synchronization of the two storage systems is equivalent to Applicant’s determining which server is inoperable and a particular portion of the storage medium the inoperable server has ownership over)

“assigning ownership of the particular portion of the storage medium to the operational server” (See col. 8, lines 34-58 and col. 14, line 63 – col. 15, line15 wherein Srinivasan’s storage controller signaling if integration of dataset into the dataset secondary storage, and furthermore, message receiving and sending volumes are created on primary and secondary data storage systems storing sequence numbers to signal the synchronization of the two storage systems is equivalent to Applicant’s

assigning ownership of the particular portion of the storage medium to the operational server); and

"causing the writing of the copy of the given file systems write data operation from the second temporary data store of the operational server to the particular portion of the storage medium" (See the Abstract where set of revisions are alternately written to either a first buffer and a second buffer and, furthermore, at col. 2, lines 18-21, col. 16, lines 21-28 and col. 6, lines 23-50 where toggling read and write switches only after transaction committed teaches detecting the status of the servers is equivalent to Applicant's causing the writing of the copy of the given file systems write data operation from the second temporary data store of the operational server to the particular portion of the storage medium).

**4. The prior art made of record**

F. U.S. Patent 6,823,236

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- A. U.S. Patent 6,397,348
- B. U.S. Patent 6,675,180
- C. U.S. Patent 5,790,773
- D. U.S. Patent 5,546,558
- E. U.S. Patent 5,832,522

***Response to Arguments***

5. Applicant's arguments with respect to claims 1-42 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusions***

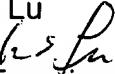
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuen S Lu whose telephone number 571-272-4114.

The examiner can normally be reached on 8 AM to 5 PM, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Kuen S. Lu

  
Patent Examiner

December 27, 2004



Luke Wassum

Primary Examiner

December 27, 2004